SK361
A2F4
385

United States Department of the Interior, Oscar L. Chapman, Secretary
Fish and Wildlife Service, Albert M. Day, Director

Fishery Leaflet 385

Washington 25, D. C. October 1950

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERIES
INVESTIGATIONS

THE EXPLORATORY FISHING VESSEL JOHN N. COBB

PART I--DESCRIPTION OF VESSEL

By J. G. Ellson*

INTRODUCTION

In order to explore the untapped fishery resources in the waters off the Pacific Northwest and Alaska, the U. S. Fish and Wildlife Service added the John N. Cobb to its fleet. This latest and newest exploratory fishing vessel was commissioned at the Department of Oceanography Dock of the University of Washington at Seattle, Washington, on February 18, 1950. Immediately following the commissioning ceremonies, an open house was held aboard the vessel and many interested scientific and industry people had an opportunity to examine the vessel.

FIGURE 1 - THE JOHN N. COBB ON A TRIAL RUN ON PUGET SOUND.

The John N. Cobb, an entirely new vessel, was designed according to the Service's specifications by W. C. Nickum and Sons, Naval Architects, Seattle, Washington. Built at Tacoma, Washington, by the Western Boat Building Company, it was launched on January 14, 1950.

Operated by the Exploratory Fishing and Gear Development Section under the Service's Branch of Commercial Fisheries, the vessel is, at first, placing emphasis on locating commercial concentrations of albacore tuna; determining their pattern of abun-

* FISHERY ENGINEER, NORTH PACIFIC EXPLORATORY FISHERY PROGRAM, EXPLORATORY FISHING AND GEAR DEVELOPMENT SECTION, BRANCH OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, SEATTLE, WASHINGTON.

NOTE: PART II OF THIS LEAFLET SUPERSEDES SEPARATE 253, A REPRINT FROM COMMERCIAL FISHERIES REVIEW, JUNE 1950, PAGES 1-3.

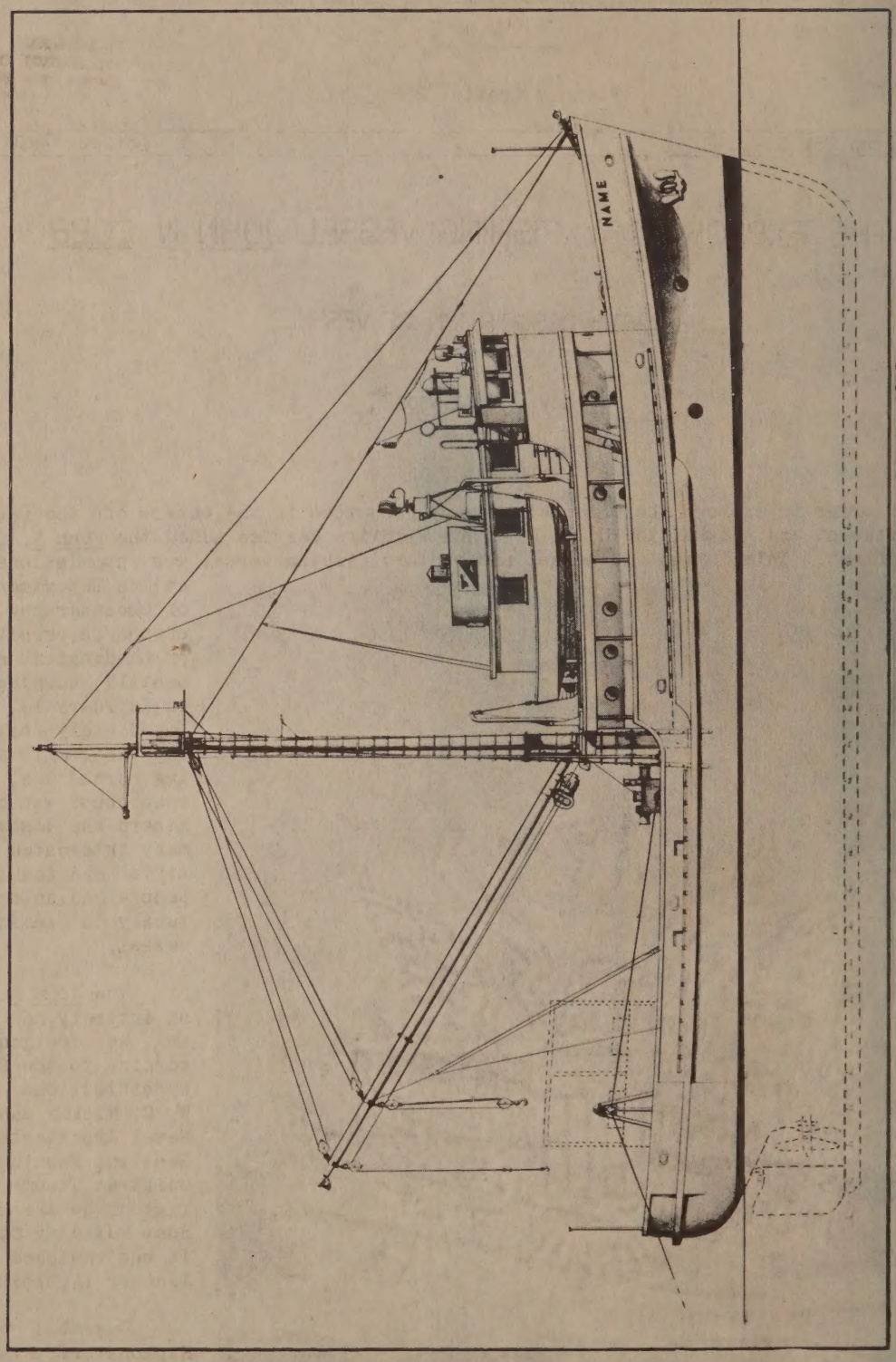
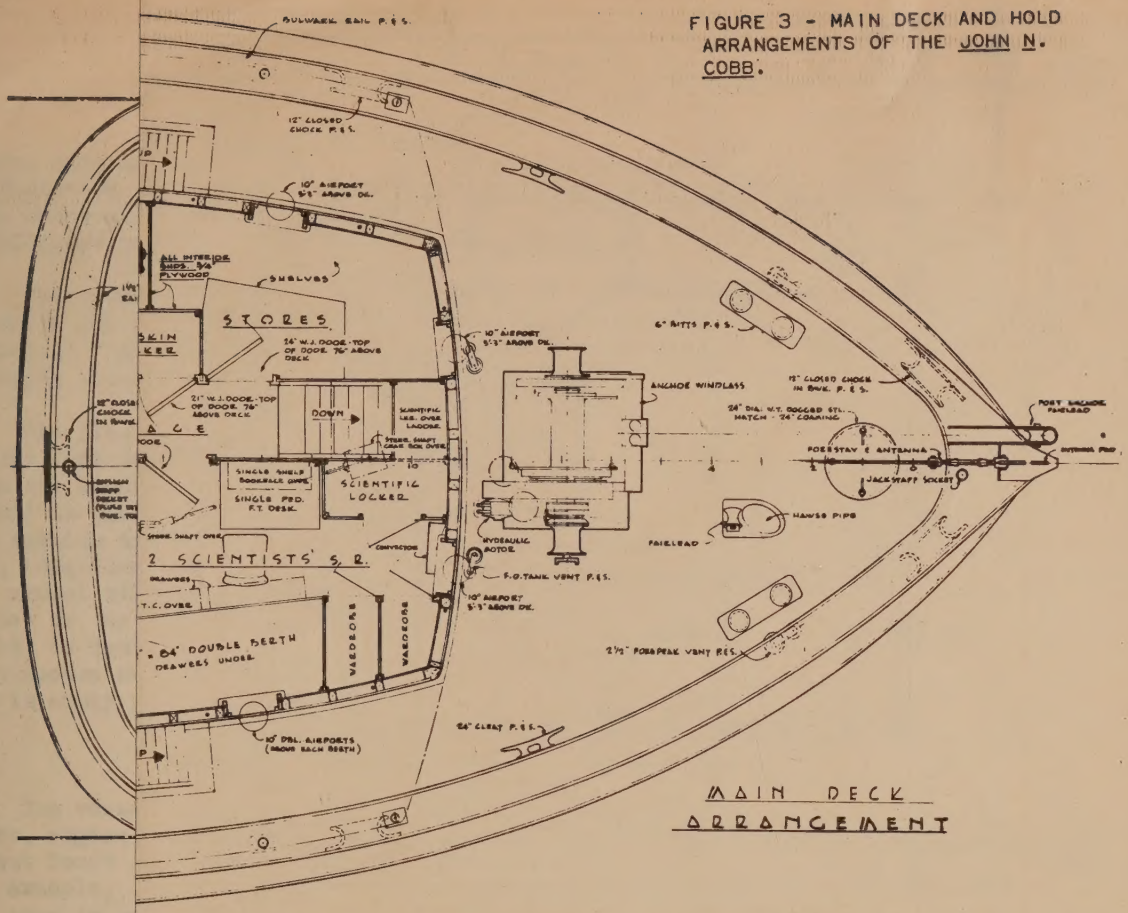


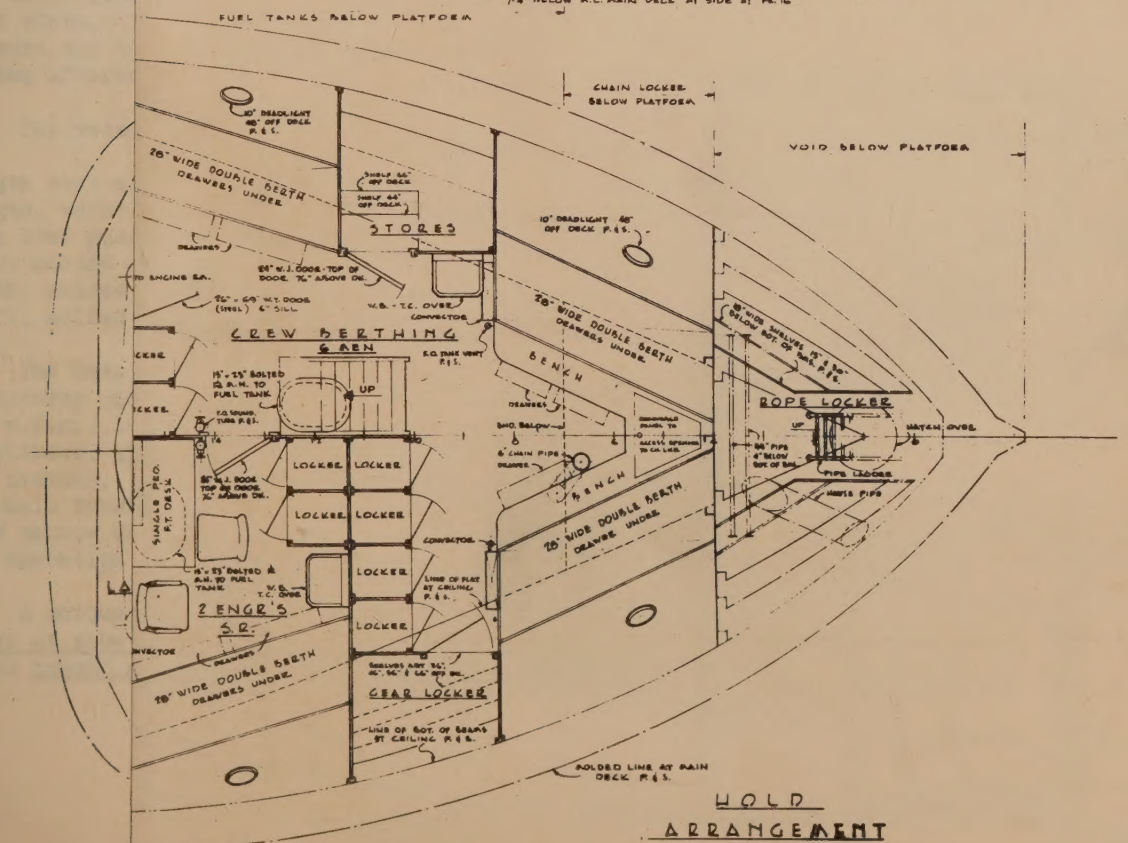
FIGURE 2 - OUTBOARD PROFILE OF THE JOHN N. COBB

FIGURE 3 - MAIN DECK AND HOLD ARRANGEMENTS OF THE JOHN N. COBB.

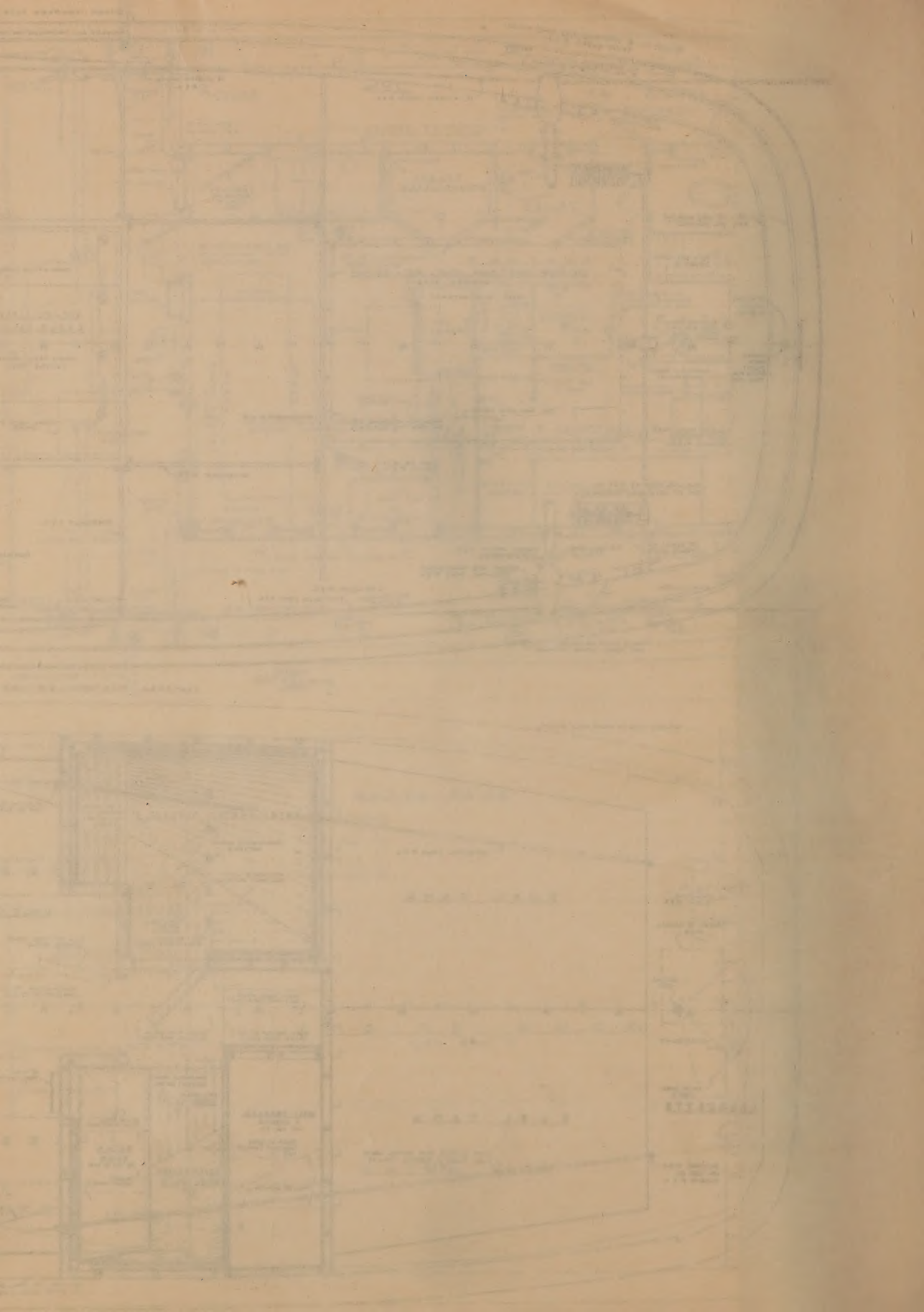

BULWARK RAIL P. & S.
12" CLOSED CHOCK P. & S.
10" AIRPORT 5'-3" ABOVE DK.
ALL INTERIOR BHDS. 3/4 PLYWOOD
SHELVES
STORES
24" W.T. DOOR - TOP OF DOOR 76" ABOVE DECK
21" W.T. DOOR - TOP OF DOOR 76" ABOVE DECK
DOWN
SCIENTIFIC LAB. OVER LAZARETTE
STORE, SHAFT, CHAIN BOX OVER
SINGLE SHELF BOOKRACK OVER
SINGLE PED. R.T. DESK
SCIENTIFIC LOCKER
CONVECTOR
2 SCIENTISTS' S. R.
DRAWERS
T.C. OVER
6'-4" DOUBLE BERTH DRAWERS UNDER
WARDROBE
WARDROBE
10" PBL. AIRPORTS (ABOVE BACK BERTH)
6" BITTS P. & S.
ANCHOR WINDLASS
12" CLOSED CHOCK IN BWK. P. & S.
24" DIA. W.T. DOGGED STL. HATCH - 24" COAMING
POST BALLAST PAYLOAD
PORESTAY & ANTENNA
JACK STAFF SOCKET
HAWSE PIPE
FAIRLEAD
HYDRAULIC MOTOR
F.O. TANK VENT P. & S.
2½" FOREPEAK VENT P. & S.
24" CLEAT P. & S.

MAIN DECK ARRANGEMENT

PLATFORM DECK FWD. - STRAIGHT SHEER - 7'-10" BELOW M.L. MAIN DK. AT SIDE AT FR. 8
7'-4" BELOW M.L. MAIN DECK AT SIDE AT FR. 16



HOLD ARRANGEMENT



dance; tracing their general migration in the waters off Oregon, Washington, and Southeastern Alaska; and determining the most effective means of capturing the tuna commercially. This phase of the work of the Exploratory Fishing and Gear Development Section will be known as the North Pacific Exploratory Fishery Program.

The vessel bears the name of a distinguished leader in the field of fisheries research and knowledge--John N. Cobb. He was the founder and first dean of the School of Fisheries at the University of Washington, as well as having had an outstanding record in the fisheries industry and with the Bureau of Fisheries.

The planning of the John N. Cobb was based largely on practical experience gained from previous exploratory cruises made with other vessels to various areas from the Washington coast to the remote northern areas of the Bering Sea. The vessel is planned as a multi-purpose fishing vessel, to fish experimentally in the various types of fishing found on the West Coast. These include seining, trawling, long-line fishing, live-bait fishing, and trolling. Range of operations for the vessel will extend from the Pacific coastal and offshore waters of the United States to the northern Bering Sea. For this reason, the John N. Cobb is strongly built; is designed to carry large amounts of fuel and water; is equipped with the most modern navigational devices; carries the latest type of life-saving equipment; and is amply powered.

DESCRIPTION OF VESSEL

The vessel's construction is of wood, with the exception of certain steel bulkheads, engine foundations, and tanks. The general design of the vessel is that of a West Coast purse-seiner with certain modifications to improve sea characteristics. For example, the house structure and machinery spaces are located somewhat further aft than in conventional seine boats; also the stern has been made eliptical with the stern lines below the deck shaped so as to avoid the flat, broad type of seine-boat stern. The hold is divided into compartments by steel watertight bulkheads forward and aft of the engine room, forward of the forecastle crew's quarters, and at the afterend of the hold.

The vessel is built to the following dimensions:

Length over-all	93' 5¼"	Draft over keel (mean load)	9' 6"
Length, waterline	85' 0 "	Bunkers, Diesel fuel	12,000 gals.
Beam over guards	25' 6¾"	Capacity, fresh water	6,000 gals.
Beam, molded	24' 6 "	Cruising speed	10 knots
Depth, molded	12' 7 "	Maximum speed	10.8 knots
Draft, molded (mean load)	8' 6 "		

The main propulsive power is supplied by an 8-cylinder, 2-cycle, Diesel engine furnishing 345 h.p. at 375 r.p.m. Since the engine is normally rated at 500 h.p. and 540 r.p.m., long life and a minimum of maintenance is expected. There are 2 auxiliary, 3-cylinder, 45 h.p., Diesel generators, each of which supplies 30 kw. for the electrical systems. One auxiliary has the dual function of running a generator or of driving the main trawl winch through a hydraulic torque converter. The other unit is the primary source of electrical power and also has the function of driving a hydraulic pump for operation of the anchor windlass and the trolling gurdies.

A unique feature of the vessel is an auxiliary drive to supply main propulsive power at slow speeds.[1/] Such is made possible by a sailing clutch which allows the

1/ SEE COMMERCIAL FISHERIES REVIEW, JUNE 1950, PP. 1-3; ALSO ISSUED AS SEPARATE NO. 253.

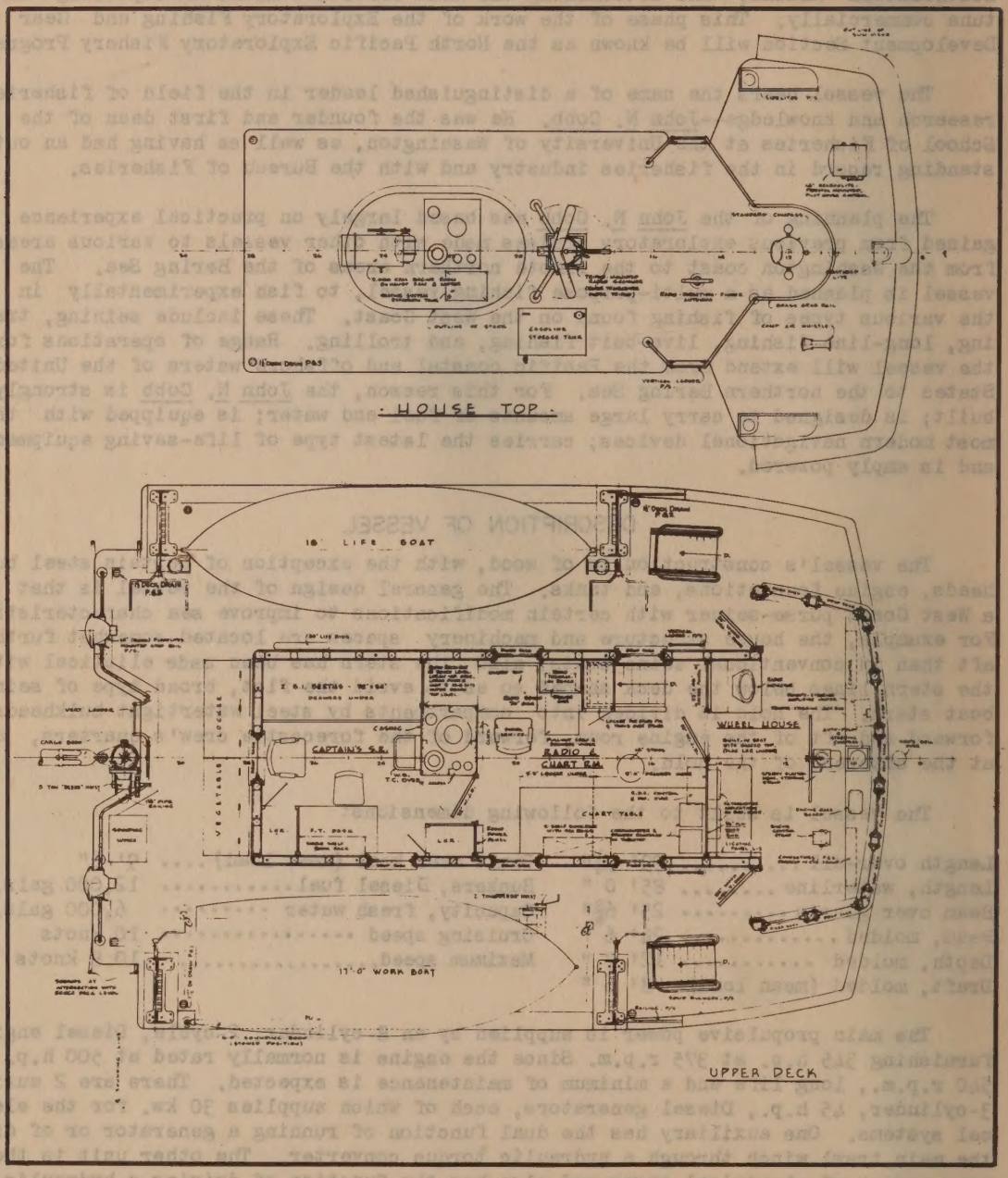


FIGURE 4 - HOUSE TOP AND UPPER DECK ARRANGEMENTS OF THE JOHN N. COBB.

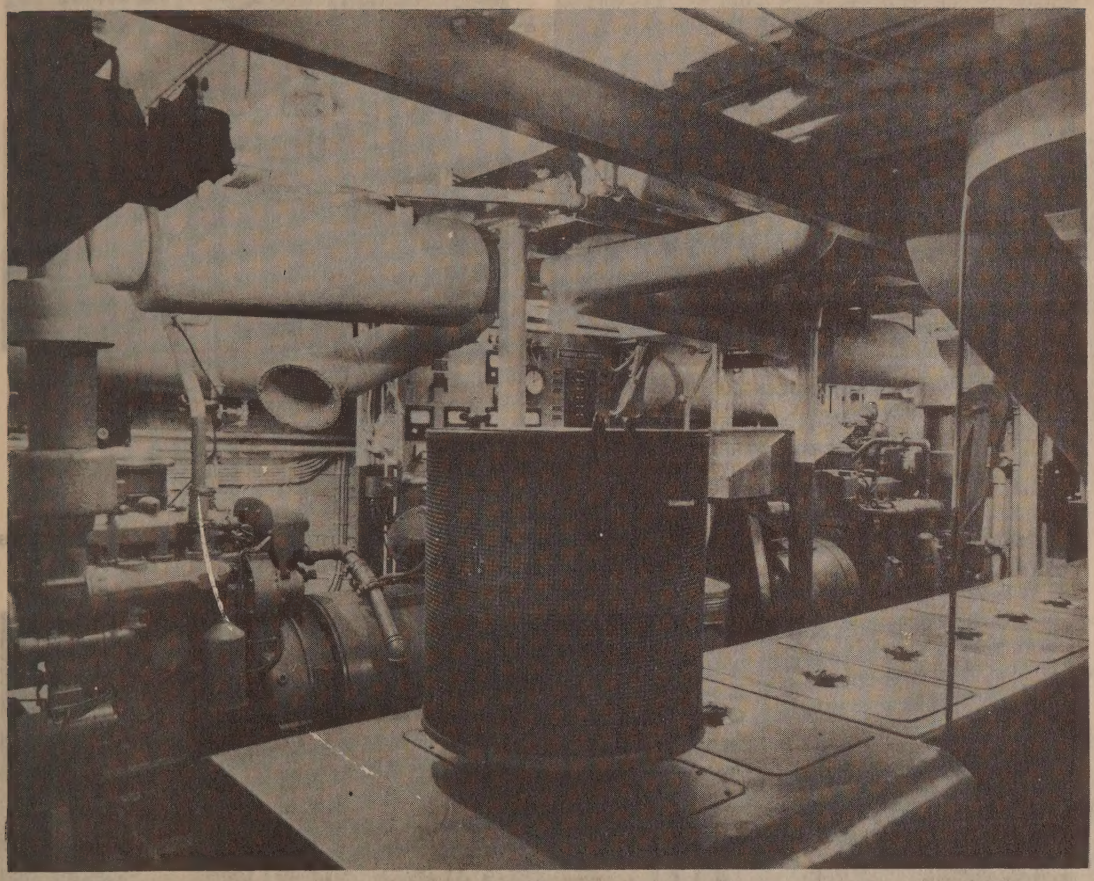


FIGURE 5 - VIEW OF THE JOHN N. COBB'S ENGINE ROOM. IN THE FOREGROUND CAN BE SEEN PART OF THE MAIN DIESEL ENGINE. TWO DIESEL AUXILIARIES ARE SEEN IN THE BACKGROUND.

main engine to be disengaged from the main drive shaft. Power is taken off the winch drive by means of a chain drive to a reduction gear which in turn is connected by a chain drive to a sprocket on the propulsion shafting. This produces variable low-vessel speeds ranging from 0 to about 3 knots, which is valuable for certain fishing operations requiring low speeds. Also, in case of main-engine breakdown, auxiliary means are available to make port for repairs. Equipped with -20° F. sharp-freezing facilities, 0° F. storage, and 1 refrigerated brine well, the vessel can stow in the hold under refrigeration approximately 50,000 pounds of frozen fish. A larger capacity was not deemed necessary for experimental work. Deck machinery, in addition to the main trawl winch which spools 500 fathoms of 5/8" wire, includes a hydraulic-powered anchor windlass, an electric-powered oceanographic winch on the topside (reeling 50 fathoms of 3/32" wire per minute), an electric boom winch, and hydraulic-powered trolling gurdies. The trawl winch is equipped also for seining and long-line fishing.

The John N. Cobb is rigged with various types of specialized fishing equipment which are readily portable. Among these are trolling poles, a bait tank,

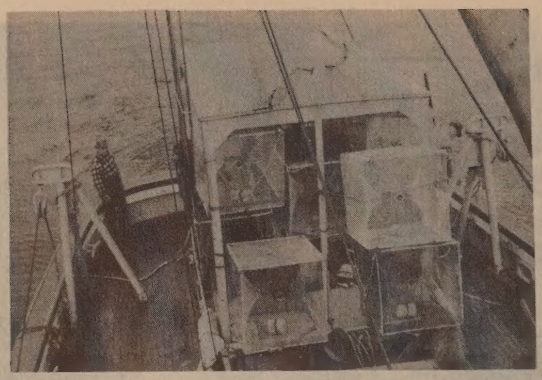


FIGURE 6 - VIEW OF AFTERDECK DURING SHRIMP FISHING OPERATIONS (SEE COMMERCIAL FISHERIES REVIEW, MAY 1950, PP. 33-4). THE GALLOWS FRAMES AND TRAWL WARPS ARE SHOWN, AS IS THE CANOPY STRUCTURE OVER THE BAIT TANK. SHRIMP TRAPS HIDE THE BAIT TANK.

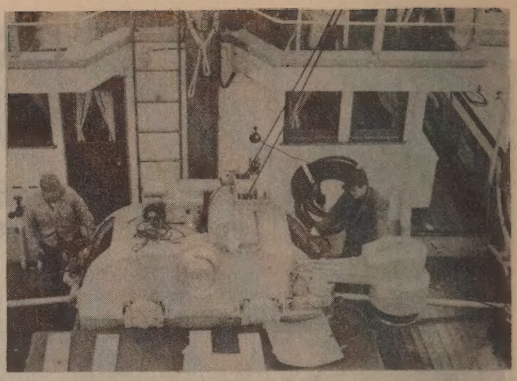


FIGURE 7 - MAIN FISHING WINCH. NOTE THE LARGE SHEAVE AT RIGHT FOR HAULING LONG-LINE GEAR.

and the gallows frames, as well as a 17-foot motor launch, complete with a stern roller, for work in shallow water, and an 18-foot conventional lifeboat.

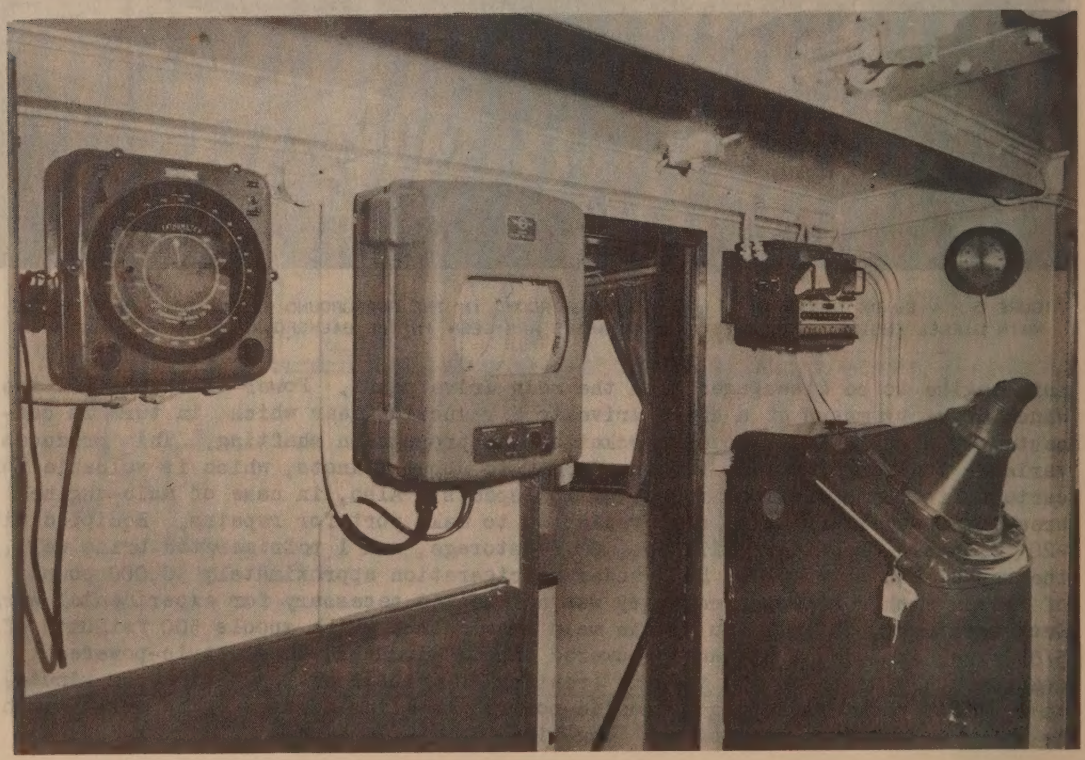


FIGURE 8 - PILOTHOUSE LOOKING AFT. NOTE THE TWO SONIC DEPTH INDICATORS, THE INTER-COMMUNICATING EQUIPMENT, SURFACE SEA TEMPERATURE RECORDER, AND THE RADAR INSTALLATION.

The vessel is also outfitted with instruments and equipment for oceanographic purposes, which include bathythermographs, bottom-sampling devices, reversing-type

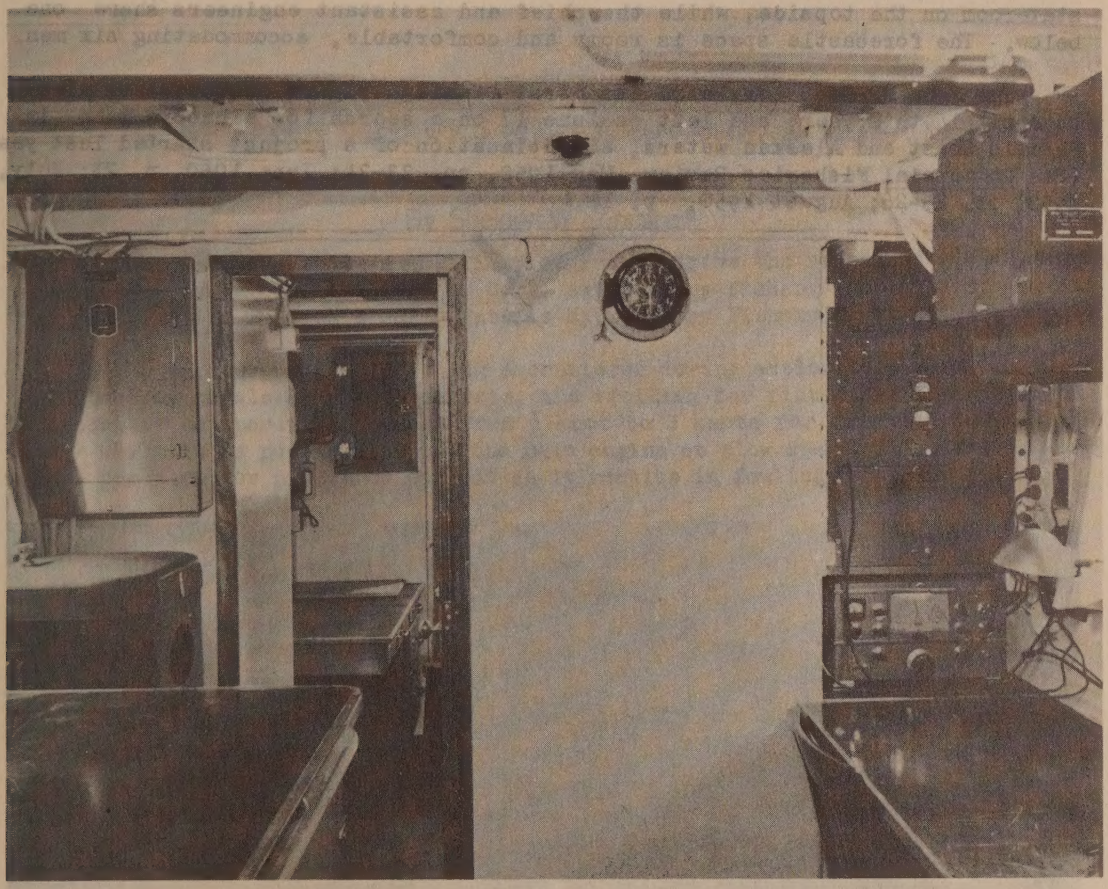


FIGURE 9 - VIEW OF CHART ROOM, SHOWING LORAN RECEIVER, 150 W. RADIO TRANSMITTER AND RECEIVER, RADAR TRANSCEIVER, AND PORTION OF LARGE CHART TABLE. THE SPACE OPENING AT THE REAR SHOWS PART OF THE ADJOINING STATEROOM.

deep-sea thermometers, and plankton nets. A small laboratory space, with a sink, is provided in the hold for work in connection with freezing and processing.

Electronic equipment found aboard includes the following:

Sonic depth recorder, audible signal
Radio telephone, 150 watt
Radio direction finder
Radar
Sonic depth recorder, recording type
Radio telephone, standby, 65 watt
Loran receiver

Steering is by means of an electric-mechanical system complete with automatic steering. Trials have clearly shown the remarkable maneuverability of the vessel. An unusually large combination chart and instrument room has been provided because of the special need for these facilities aboard.

Facilities for scientific personnel have been furnished. Two staterooms for scientific personnel--each has two bunks, and is equipped with desk, shelf, and locker space for scientific instruments. The captain and mate share a stateroom on the topside, while the chief and assistant engineers share one below. The forecastle space is roomy and comfortable, accommodating six men.

The John N. Cobb completed its first fishing trip to southeastern Alaska on April 14 this year; and left on June 12 on a search for albacore tuna in Pacific Coast and Alaskan waters, a continuation of a project started last year. (See Commercial Fisheries Review, May 1950, pp. 33-34; June 1950, p. 21; July, 1950, pp. 25-26; August 1950, p. 18.)

PART II--JOHN N. COBB USES NEW RIG FOR SLOW-SPEED TROLLING

By Sheldon W Johnson*

A power take-off from an auxiliary engine to drive the vessel at slow speeds is a special feature of the John N. Cobb, exploratory fishing vessel of the U. S. Fish and Wildlife Service's North Pacific Exploratory Fishery Program.

In the various types of fishing encountered during exploratory work, such as, towing shrimp trawls and plankton nets, and trolling for fish other than tuna, it is necessary to operate at speeds from ½ knot to 3 knots for extended periods of time. While it is possible to run the main engine at slow speed, it is not recommended practice for prolonged periods as it results in fouling.

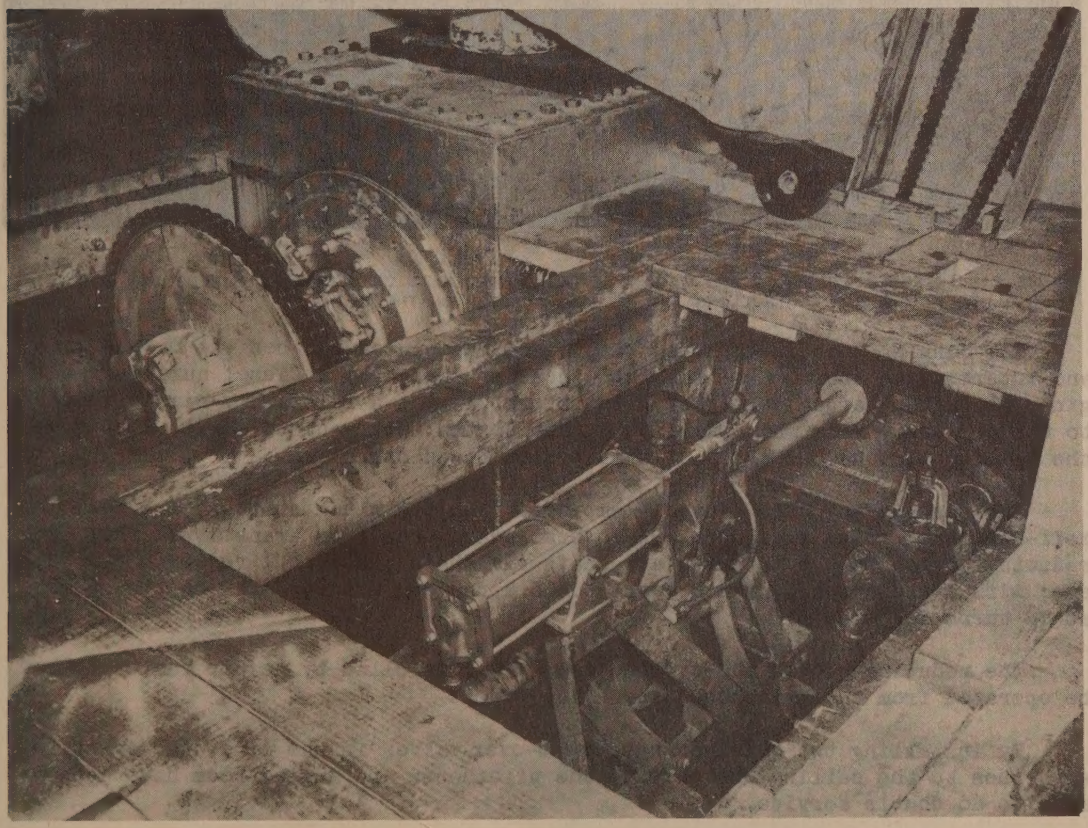


FIGURE 1 - THE JOHN N. COBB'S MAIN SHAFT AND SPROCKET AT LEFT. THE AIR RAM CONTROLLING THE CLUTCH ON THE REDUCING GEARS ON THE LOWER RIGHT. CHAIN DRIVE AND SHAFT FROM AUXILIARY ENGINE IN BACKGROUND.

*Master, John N. Cobb, exploratory fishing vessel, North Pacific Exploratory Fishery Program, U. S. Fish and Wildlife Service, Seattle, Wash.

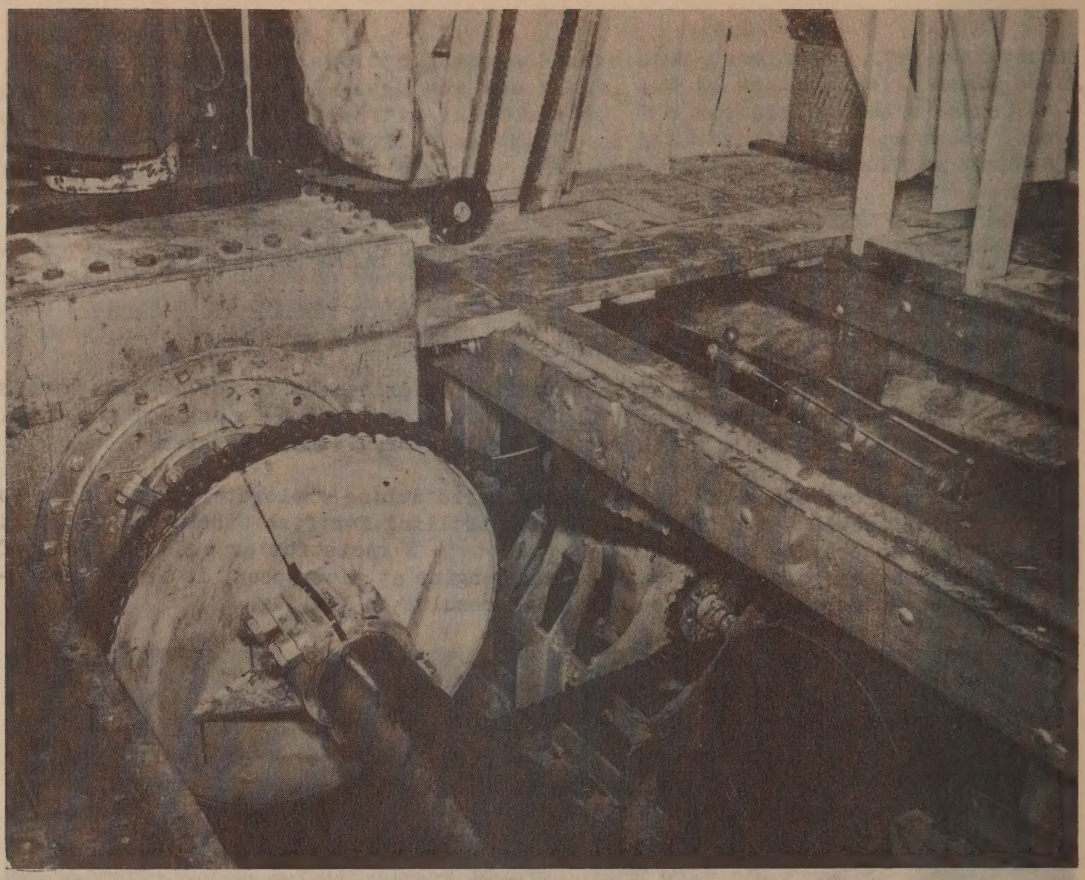


FIGURE 2 - INTERMEDIATE SHAFT AND 7 TO 1 REDUCING SPROCKETS CONNECTED WITH REDUCING GEARS AND CLUTCH. AIR RAM CONTROLLING THE REDUCING CLUTCH ON THE RIGHT.

The John N. Cobb is equipped with a sailing clutch between the main engine and intermediate shaft. The fishing winch is powered by a Diesel auxiliary engine, through a torque converter. Therefore, it was a relatively simple matter to tie the power from the auxiliary engine to the intermediate shaft, disengage the sailing clutch, and have a flexible slow-speed operation.

A chain and sprocket drive is employed from the winch shaft to a 3 to 1 self-contained reducing clutch and reverse gear. Power is transmitted from the reducing clutch to the intermediate shaft via chain and 7 to 1 reducing sprockets, with a shaft speed from 0 turns to 85 turns per minute. The ship's speed at 80 turns is 3 knots.

The reducing clutch and reverse gear are controlled by an air ram which may be operated from the pilothouse or engine room.

By installing two quick-change, cross-over valves in the line, the existing air lines to the sailing clutch from the pilothouse and engine room have been made to do double service.

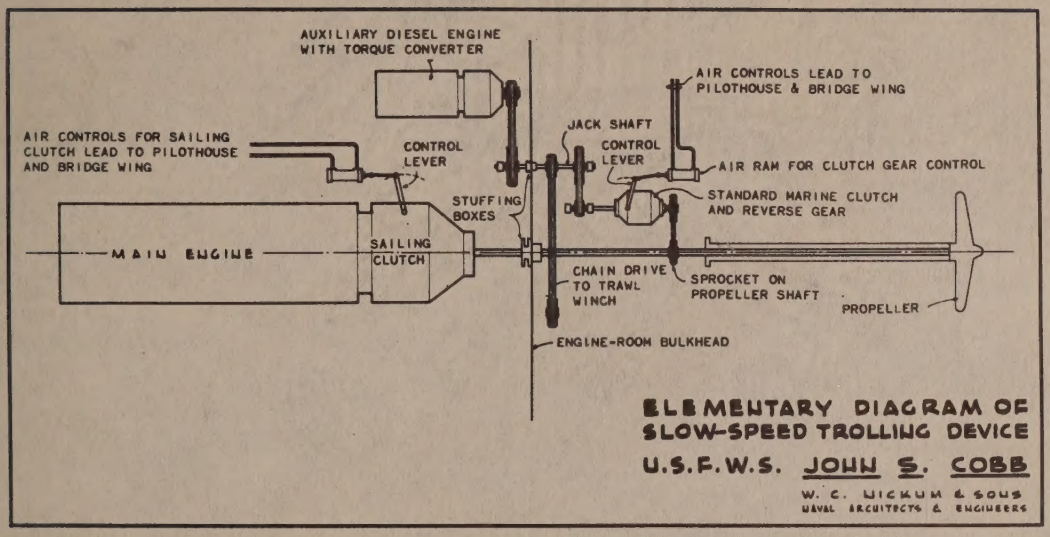


FIGURE 3 - ELEMENTARY DIAGRAM OF SLOW-SPEED TROLLING DEVICE.

The whole installation was kept simple with a minimum number of parts.

A further feature of the installation is that it could be used to furnish emergency motive power in the event of main-engine failure.

Interior--Duplicating Section, Washington, D. C.

84192